Allegheny County Health Department

BUREAU OF ENVIRONMENTAL QUALITY
Division of Air Quality
301 Thirty-ninth Street
Pittsburgh, Pennsylvania 15201-1891

September 15, 1994

Mr. Thomas Maslany
Director Air, Radiation
& Toxics Division
US Environmental Protection Agency
Region III (3AT00)
841 Chestnut Building
Philadelphia, PA 19107

Dear Mr. Maslany:

Attached are copies of a Notice of Public Hearing, a draft enforcement order to be issued to USX Corporation, and a draft addition of Appendix 32 to Allegheny County's portion of the Pennsylvania State Implementation Plan.

This proposed source-specific SIP revision codifies significant improvements to the USX Clairton Works desulfurization facility and demonstrates that these improvements are sufficient to protect the SO_2 NAAQS in the Liberty Borough/Clairton Area. Thus Allegheny County maintains that the proposed redesignation of this area is unnecessary.

Your comments are welcome.

Very truly yours,

Roger C. Westman

Roger C. Westman
Division Manager

CJW
Enclosure

25-CS-0494

to be published in the PITTSBURGH POST-GAZETTE Friday, SEPTEMBER 16, 1994

NOTICE OF PUBLIC HEARING
FOR PROPOSED AMENDMENT TO
ALLEGHENY COUNTY'S PORTION OF THE
STATE IMPLEMENTATION PLAN
FOR AIR POLLUTION CONTROL

The Allegheny County Health Department will hold a public hearing on the proposed issuance of an air pollution control enforcement order and the proposed amendment of Allegheny County's portion of the State Implementation Plan for air pollution control on Wednesday, October 19, 1994, beginning at 9:30 AM in the 1st Floor Conference Room of Building #7 at the Clack Health Center, 301 39th St., at Penn Ave., Lawrenceville, City of Pittsburgh, PA 15201.

Copies of the proposed order and supporting documentation may be examined beginning on Friday, September 16, 1994, at the Allegheny County Law Library, 9th Floor, City-County Building, Grant St., Pittsburgh, PA 15219 (call 355-5353 for hours), or at the Allegheny County Health Department Library, Bldg. #7 of the Clack Health Center, first floor, 301 39th St., Lawrenceville, City of Pittsburgh, PA 15201, from 8:30 AM to 3:30 PM Mon. through Fri.

Oral testimony shall be limited to twenty (20) minutes and written copies are required. Requests to present oral testimony must be received by Monday, October 17, 1994, and written comments and copies of oral testimony must be received by 4:00 PM on Monday, October 24, 1994, and such requests, comments, and copies must be mailed to Cari Weaver, Planning Section, Allegheny County Division of Air Quality, 301 39th St., Pittsburgh, PA 15201-1891.

{cont'd.}

If the proposed order is issued and becomes final it will subsequently be submitted for approval by the Allegheny County Board of Commissioners on December 15, 1994, and if approved will then be submitted to state and federal environmental agencies for approval as a revision to the County's portion of the State Implementation Plan for air pollution control.

The order, in summary, immediately upon final issuance, will require USX Corporation and USS, A Division of USX Corporation, at the coke oven gas desulfurization plant at the USS Clairton Coke Works, Clairton, PA, to maintain and have ready for operation spares of each of the following equipment: Claus Plant; Hydrogen Cyanide Destruct Unit catalytic reactor; Vacuum Carbonate Unit absorber column; Vacuum Carbonate Unit axi compressor; Vacuum Carbonate Unit stripper; seven Vacuum Carbonate Unit heat exchangers; and nine Vacuum Carbonate Unit pumps.

* * *

Revision to

ALLEGHENY COUNTY'S

portion of the

PENNSYLVANIA STATE IMPLEMENTATION PLAN

for the

Attainment and Maintenance of the

National Ambient Air Quality Standards

Appendix 32

Source-Specific

USX Clairton Works SO2

Attainment Plan

D R A F T

(9-15-94)

ALLEGHENY COUNTY HEALTH DEPARTMENT
BUREAU OF ENVIRONMENTAL QUALITY
DIVISION OF AIR QUALITY

In re:

USX Corporation USS, A Division of USX Corporation 600 Grant Street Pittsburgh, PA 15219-2749	)	ENFORCEMENT ORDER NO. _____ UPON CONSENT

WHEREAS the United States Environmental Protection Agency (hereinafter "EPA") proposed, on September 22, 1992 (57FR43850), to redesignate portions of Allegheny County located in and around the City of Clairton ("the Clairton area") as nonattainment for sulfur dioxide; and

WHEREAS the Allegheny County Health Department ("the Department") objected to the proposed redesignation of the Clairton area because, among other things, certain significant improvements have been made to the coke oven gas desulfurization facility at the Clairton Works of USX Corporation ("USX") as recognized by the Department and the Allegheny County Air Pollution Control Advisory Committee (see Attachments A and B); and because of recent improvements in air quality in the Clairton area; and

WHEREAS USX has voluntarily installed certain equipment and made certain modifications to its Clairton Works coke oven gas desulfurization facility as part of its overall pollution prevention efforts; and

WHEREAS EPA, on December 21, 1993 (58FR67334), deferred action on its proposed redesignation of the Clairton area pending codification of the significant improvements to the Clairton Works coke oven gas desulfurization facility into a federally-approved State Implementation Plan ("SIP") for Allegheny County; and

WHEREAS USX and the Department wish to enter into an enforcement order upon consent which will legally require USX to make certain additional improvements and to properly operate and/or maintain the improvements previously made to its Clairton Works coke oven gas desulfurization facility; and

WHEREAS USX and the Department desire that such an enforcement order upon consent be submitted through the Commonwealth of Pennsylvania to the EPA as a proposed revision to the SIP for sulfur dioxide for Allegheny County.

NOW, THEREFORE, this _____ day of _____, 1994, the Department, pursuant to Section 301 of Article XX, Rules and Regulations of the Allegheny County Health Department, Air Pollution Control, ("Article XX") and upon agreement of the parties as herein set forth, hereby issues this Enforcement Order:

I. ORDER

A. Claus Plant

1. USX shall, at all times, properly maintain two Claus Plants at the Clairton Works coke oven gas desulfurization facility. Each Claus Plant shall be capable of independently processing all of the coke oven

gas produced by the Clairton Coke Plant at full production.

2. USX shall operate one Claus Plant at all times when coke oven gas is being produced at the Clairton Works.

3. a. USX shall, at all times, have its second Claus Plant ready for start-up and operation when a breakdown of the first Claus Plant occurs, except when the second Claus Plant is down for repairs, maintenance or modification. All repairs, maintenance and modifications to Claus Plants shall be made as expeditiously as practicable.

b. The second Claus Plant shall start up and be fully operational within 18 hours of each breakdown on the first Claus Plant if the plant production is below 5,000 tons of coke per day at the time of the breakdown, or within 30 minutes of each such breakdown if the production is 5,000 tons of coke per day or greater.

B. HCN Destruct Unit

1. USX shall operate and maintain an HCN (hydrogen cyanide) Destruct Unit at all times that coke oven gas is being produced at the Clairton Works.

2. The HCN Destruct Unit shall have two catalytic reactors, each of which is capable of independently processing all of the feed gas to the HCN Destruct Unit when the Clairton Coke Plant is operating at full production.

3. USX shall have its second catalytic reactor ready for immediate operation at all times except when the second catalytic reactor is down for repairs. All repairs to catalytic reactors shall be made as expeditiously as practicable.

C. Vacuum Carbonate Unit

1. Absorber Columns and Axi Compressors

a. USX shall operate and maintain a Vacuum Carbonate Unit at all times that coke oven gas is being produced at the Clairton Works.

b. The Vacuum Carbonate Unit shall have two absorber columns, each of which is capable of independently processing all of the gas flow through the Vacuum Carbonate Unit when the Clairton Coke Plant is operating at full production.

c. The Vacuum Carbonate Unit shall have two axi compressors, each of which is capable of independently processing all of the acid gases generated at the Vacuum Carbonate Unit when the Clairton Coke Plant is operating at full production.

d. USX shall operate one absorber column and one axi compressor at all times when coke oven gas is being produced at the Clairton Works.

e. USX shall have its second absorber column and its second axi compressor ready at all times for

operation within two hours except when the second absorber column or second axi compressor is down for repairs, maintenance or modifications, or when there is a sudden, unexpected failure of a primary unit(s). If there is a sudden, unexpected failure of the primary absorber column or the primary axi compressor, the secondary unit(s) shall be operational within eight hours of such failure(s). All repairs, maintenance and modifications to absorber columns and the axi compressors shall be made as expeditiously as practicable.

2. Strippers

a. USX shall, at all times, properly maintain two strippers in the Vacuum Carbonate Unit at the Clairton Works coke oven gas desulfurization facility.

b. Each stripper shall be capable of independently processing all of the solution from the absorber column.

c. USX shall operate one stripper in its Vacuum Carbonate Unit at all times when coke oven gas is being produced at the Clairton Works.

d. USX shall, at all times, have its second stripper ready for operation within three (3) hours except when the second stripper is down for repairs, maintenance or modification. All repairs, maintenance and modifications to the strippers shall be made as expeditiously as practicable.

D. Heat Exchangers and Pumps

1. USX shall, at all times, maintain in good working order spare heat exchangers in the Vacuum Carbonate Units at the Clairton Works coke oven gas desulfurization facility as set forth in Attachment C.

2. USX shall, at all times, maintain in good working order spare pumps in the Vacuum Carbonate Units at the Clairton Works coke oven gas desulfurization facility as set forth in Attachment D.

E. Reporting of Breakdown or Unavailability of Equipment

1. USX shall report, in accordance with the requirements of Section 202.C of Article XX, any event that causes the breakdown or unavailability of: (a) any Claus plant, stripper, absorber column or axi compressor required by this Order to be operated, to be ready for immediate operation, or to be available as spare equipment; (b) both a heat exchanger and its respective spare, as set forth in Attachment C; or (c) both a pump and its respective spare, as set forth in Attachment D.

II. AGREEMENT

The foregoing Order shall be enforced in accordance with and is subject to the following agreement of the parties, to wit:

A. If USX fails to comply, in a timely manner, with any of the requirements of the foregoing Order except for Paragraph I.B.1, USX shall pay, upon demand, a stipulated penalty of $1,500 per day for each day that each violation continues. Stipulated penalties accruing under this Order and Agreement shall be paid within twenty (20) days of demand by the Department. Payment shall be made by check payable to the "Allegheny County Health Department Clean Air Fund" and shall be sent to:

Enforcement Division Chief
Bureau of Environmental Quality
Allegheny County Health Department
301 - 39th Street, Building 7
Pittsburgh, PA 15201-1891

B. Failure to comply with any provision of this Order and Agreement within the time specified herein is a violation of Article XX that may also subject USX to criminal and civil proceedings, including injunctive relief, by the Department, in addition to the stipulated penalties under Paragraph II.A.

C. If any event occurs which is beyond the control of USX and which causes or may cause delays in the achievement of the actions required under this Order, then:

1. USX shall notify the Department in writing within ten (10) days of the delay or anticipated delay, describing in detail the nature of the delay, the anticipated length

of the delay, the precise cause or causes of the delay, the measures taken and to be taken by USX to prevent or minimize the delay, and the timetable by which those measures will be implemented. USX shall adopt all reasonable measures to avoid or minimize any such delay. Failure by USX to comply with the notice requirement of this subparagraph (II.C.1.) specifically shall render the remaining provisions of this paragraph (II. C.2 and II. C.3) void and of no effect as to the particular incident involved.

2. If the Department agrees that the delay or anticipated delay in complying with this Order has been or will be caused by circumstances beyond the control of USX, the time for performance hereunder may be extended for a period no longer than the delay resulting from such circumstances.

3. The burden of proving that any delay is caused by circumstances beyond the control of USX shall rest with USX. Increased costs or expenses associated with the implementation of actions called for by this Order shall not, in any event, be a basis for changes in this Order or extensions of time under this paragraph. Delay in achievement of one interim step shall not necessarily justify or excuse delay in achievement of subsequent steps.

D. This Order does not, in any way, preclude, limit or otherwise affect any other remedies available to the Department for violations of this Order or of Article XX, including, but not limited to, actions to require the installation of additional pollution control equipment and the implementation of additional corrective operating practices.

E. Paragraph II. A of this Order and Agreement shall terminate six (6) months after the effective date of this Enforcement Order.

F. USX hereby consents to the foregoing Order and hereby knowingly waives all rights to appeal said Order, and the undersigned represents that he is authorized to consent to the Order and to enter into this Agreement on behalf of USX.

IN WITNESS WHEREOF, and intending to be legally bound, the parties hereby consent to all of the terms and conditions of the foregoing Order and Agreement as of the date above written.

USX CORPORATION

By : _____

George T. Weber, Jr.
General Manager - Coking Operations

ALLEGHENY COUNTY HEALTH DEPARTMENT

BY: _____

Bruce W. Dixon, MD
Director

By: _____

Ronald J. Chleboski
Deputy Director
Bureau of Environmental Quality.

ATTACHMENT A

Allegheny County Health Department

BUREAU OF AIR POLLUTION CONTROL
301 Thirty-ninth Street
Pittsburgh, Pennsylvania 15201
(412)578-8101

April 21, 1992

Dr. Jay D. Hair
President and Chief Executive Officer
National Wildlife Federation
1400 Sixteenth Street, N.W.
Washington, DC 20036-2266

Dear Dr. Hair:

The Allegheny County Health Department Bureau of Air Pollution Control has been working with the metallurgical coke industry within our borders for many years to reduce airborne emissions, including sulfur dioxide. Significant success has been achieved in all instances through improved equipment and practices. To date though, the most dramatic improvement observed is the reduced sulfur dioxide emissions associated with the coke oven plant of the United States Steel Corporation (USS) at Clairton, Pennsylvania. This is especially significant because the Clairton coke plant is the largest coke oven operation in the United States.

The total measured sulfur content of coke oven gas is reported as equivalent hydrogen sulfide (H2S) for convenience and uniformity of reporting. In the County the requirement is 50 grains (grs) of H2S per 100 dry standard cubic feet (DSCF) of combusted gas. To achieve even these levels of sulfur requires special equipment for processing the raw coke oven gas and removing sulfur prior to being recirculated as a fuel gas. Raw coke oven gas is extremely corrosive and the desulfurizing equipment is essentially a "self destruct mechanism" requiring intensive and specialized maintenance.

Over the past several years USS and especially the Clairton plant has taken the initiative in regard to reducing air pollution associated with coke production. Operating and maintenance practices have been reviewed and updated; intensive training programs for supervisors and workers have been instituted; and, extensive equipment upgrades have been implemented, including equipment redundancy for greater reliability.

At the same time various task forces consisting of supervisors and workers, with requisite authority and responsibility, have been established to concentrate on specific problem areas, such as proper operation and performance at the coke oven gas desulfurization plant. The task force of interest in this instance was originally dubbed the "Under 30 Team." This team was so successful at achieving the goal of a daily average of less than 30 grs H2S/100 DSCF that it was subsequently renamed the "Under 20 Team" with the obvious goal of maintaining a daily average of less than 20 grs H2S/100 DSCF. This goal was achieved five months ago and has been sustained ever since.

The overall success for this dramatic improvement, far beyond that required by any existing regulations, could only have been achieved through a sincere dedication on the part of all levels of management and workers to reduce air pollution associated with the plant, proper maintenance of the equipment resulting in increased reliability and TEAMWORK such as that exhibited by the "Under 20 Team."

The pollution control efforts by USS at the Clairton Coke Works and specifically the "Under 20 Team" program serve as an example of corporate commitment to environmental improvement and a model program for other coke operations to emulate. The environmental commitment and accomplishments of the USS Clairton Coke Works personnel receive our endorsement and warrants strong consideration for the National Wildlife Federation Corporate Conservation Council 1992 Environmental Achievement Award.

Sincerely yours,

Ronald J. Chleboski
Deputy Director
Bureau of Air Pollution Control

RJC/WGG:mmt

ATTACHMENT B

MRS. ROBERT WARDROP II
3955 BIGELOW BOULEVARD
PITTSBURGH, PENNSYLVANIA 15213

April 15, 1992

Dr. Jay D. Hair, President
National Wildlife Federation
1400 Sixteenth Street, N.W.
Washington, DC 20036-2266

Dear Dr. Hair:

This letter is for the attention of your Corporate Conservation Council and is promoting the accomplishments of U.S. Steel for recognition for the Council's 1992 Environmental Achievement Award.

The Allegheny County Air Pollution Control Advisory Committee has worked closely with the County Health Department on monitoring the air standards at the U.S. Steel Coke Works at Clairton, PA. This is one of the largest coke works in the country, and in times past has been cited often for venting untreated coke oven gases into the atmosphere. It has presented one of the worst pollution problems in the County.

Several years ago U.S. Steel began a program to cure such inadvertent violations, and determined to combine state-of-the-art technology with special personnel training to solve the problem once and for all. The results have been astonishing and well beyond mere compliance. We invited the U.S. Steel team to address our Committee meeting on March 31, and their report was an inspiration.

The effort began with a special training program for plant personnel, initiated with the help of Allegheny County Community College, and the subsequent formation of a combined management and employee "Under Twenty Team." The name refers to a target of 20 grains of hydrogen sulfide per 100 cubic feet of gas (as opposed to 50 grains mandated by the County) which is a 50 percent reduction over past performance. The 20 grain goal has been achieved and is a tremendous triumph in itself, setting new feasibility standards for coke works pollution everywhere. Beyond that, the program has engendered a dedication and enthusiasm in the work force to gain even greater control. One of the team said "If we can get hydrogen sulfide levels to zero we are going to get there" and another said "Our goal now is to make the plant environmentally invisible."

This program, applied with imagination and vigor as to what has long been a very serious pollution program, has produced results far beyond even the most optimistic expectations. It is an example to inspire the entire coke producing industry, and exciting proof that pollution standards everywhere can be dramatically improved with the kind of teamwork and dedication which the U.S. Steel "Under Twenty Team" has shown.

These efforts, so successfully pursued, and accomplished against daunting odds, make U.S. Steel eminently worthy of consideration for the Corporate Conservation Council's 1992 Environmental Achievement Award.

Sincerely,

Ann P. Wardrop

Ann P. Wardrop
Vice-Chairman
Allegheny County Air Pollution
Control Advisory Committee

ATTACHMENT C

Listing of Critical Heat Exchangers and Spare Heat Exchangers
for the Vacuum Carbonate Unit at the Clairton Works
Coke Oven Gas Desulfurization Facility

Unit	Heat Exchangers
100 Vacuum Carbonate Unit	
Carbonate Reboiler	101-CA 101-CB
Process Water Cooler	102-C1 102-C2
Carbonate Solution Heat Exchanger	103-CA 103-CB
600 Vacuum Carbonate Unit	
Solution Reboiler	E-652A E-652B
Carbonate Solution Heat Exchanger	E-654A E-654B
Process Water Cooler	E-655A E-655B
For Both 100 and 600 Vacuum Carbonate Units	
Vacuum Pump Aftercooler	E-667 102-F

ATTACHMENT D

Listing of Critical Pumps and Spare Pumps
for the Vacuum Carbonate Units at the Clairton Works
Coke Oven Gas Desulfurization Facility

Unit	Pumps
100 Vacuum Carbonate Unit	
Compressor Lube Oil	P-101J
	P-101J Coppus
Turbine Lube Oil	P-101JT
	P-101JTT
Lean Carbonate Solution	P-111J
	P-111JA
Direct Condenser	P-113J
	P-113JA
Rich Carbonate Solution	P-662A
	P-662B
600 Vacuum Carbonate Unit	
Rich Solution	P-662
Lean Carbonate Solution	P-663A
Direct Condenser Water	P-664
Common spare for Rich Solution, Lean Carbonate Solution, and Direct Condenser Water	P-663B
Lube Oil	C-658A
	C-658B

Technical Support Document

to Appendix 32 of

ALLEGHENY COUNTY'S

portion of the

PENNSYLVANIA STATE IMPLEMENTATION PLAN

for the

Attainment and Maintenance of the

National Ambient Air Quality Standards

Source-Specific

USX Clairton Works SO2

Attainment Plan

TABLE OF CONTENTS

1.0. Introduction

This document is a revision to the Allegheny County portion of the Pennsylvania State Implementation Plan, hereafter referred to as the "Plan". The information provided below correlates the SO_2 monitored violations that led to the proposed redesignation of the Liberty Borough/Clairton Area to specific equipment failures at the USX Clairton Works. Hence this source-specific Plan codifies improvements, proper operation and maintenance of the coke oven gas desulfurization facility at the USX Clairton Works to minimize future breakdowns and prevent air quality violations.

1.1. Proposed Redesignation

On September 22, 1992, EPA proposed (57 CFR 43850) to redesignate portions of Allegheny County as non-attainment for sulfur dioxide including the Lincoln, Liberty, Glassport, and Port Vue Boroughs along with the City of Clairton. The redesignation was proposed due to violations of the 24-hour primary SO_2 standard that occurred during the period November 1987 through April 1990.

On December 21, 1993, EPA did not take final action (58 CFR 67334) on their proposed redesignation of the Liberty Borough/Clairton Area based upon the following comments:

- The USX Clairton Works, the principle source of SO_2 emissions in this area, invested a substantial amount of money and effort into making enhancements to its coke oven gas desulfurization facility.

- The changes by USX resulted in improvements in SO_2 air quality in this area and are sufficient to protect the National Ambient Air Quality Standards, NAAQS, for SO_2.

- The monitored exceedances correlate with specific sulfur-removal equipment failures and outages.

EPA deferred action pending codification of the certain significant improvements to the USX Clairton Works coke oven gas desulfurization facility into a federally-approved Plan for Allegheny County.

2.0. Air Quality

This section begins by describing the monitored violations of SO_2 in the Liberty Borough/Clairton Area. Then air quality trends are presented from 1987 through July 1994.

2.1. Monitored Exceedances

Allegheny County monitors the SO_2 air quality at three locations within the proposed nonattainment area: Liberty, Glassport, and Clairton. Clairton, the newest station, was established in April 1990.

Since April 26, 1990, there have been no violations nor exceedances of the 24-hour SO_2 standard. There has only been one violation of the 24-hour standard since August 1988. Air quality at the Glassport monitor violated the 24-hour standard in 1990 by exceeding the standard on January 31st and April 26th. One exceedance occurred at the Liberty monitor on March 17, 1989.

2.2. Air Quality Trends

The air quality over the past decade has never exceeded the annual SO_2 standard of 80 $\mu g/m^3$ or 0.03 ppm. Additionally, during the last four years there have been no exceedances of the 24-hour standard of 365 $\mu g/m^3$ or 0.14 ppm.

The annual average concentrations of SO_2 and the daily maximum SO_2 levels measured in the Liberty Borough/Clairton Area since 1987 are given in Table 2.2.1. The daily maximum and annual average values monitored at Glassport, Liberty and Clairton are presented graphically in Figures 2.2.1 through 2.2.6. As illustrated in Figure 2.2.1., the daily maximum at Glassport decreased from 0.232 ppm to 0.103 ppm within normal variation with the exception of the 1990 violation. Figure 2.2.2. shows that since 1988, the annual average at Glassport has steadily declined and remained at half of the standard for the most recent three years.

As denoted in Figure 2.2.3, the daily maximum steadily declined within normal variations, from 1988 through 1993 at the Liberty monitor. Figure 2.2.4 clearly shows the Liberty annual average falling from a high of 80% of the standard in 1988 to 63% in 1990 to 53% of the standard in 1993.

From 1990 through 1993, the Clairton daily maximum has consistently remained below 55% of the standard. Additionally, the annual average has been 33% of the standard since the Clairton SO_2 station was established.

Table 2.2.1. Annual Average and Peak Daily SO_2 Data from 1987 through July 1994 given in ppm

Year	Station	Annual Average	Daily Maximum
1987	Glassport	0.024	0.168
	Liberty	0.022	0.161
1988	Glassport	0.027	0.232
	Liberty	0.024	0.203
1989	Glassport	0.023	0.112
	Liberty	0.021	0.182
1990	Glassport	0.020	0.187
	Liberty	0.019	0.105
	Clairton*	0.010	0.035
1991	Glassport	0.015	0.090
	Liberty	0.014	0.070
	Clairton	0.011	0.051
1992	Glassport	0.015	0.083
	Liberty	0.013	0.074
	Clairton	0.010	0.075
1993	Glassport	0.015	0.103
	Liberty	0.016	0.065
	Clairton	0.011	0.039
1994**	Glassport	0.017	0.103
	Liberty	0.017	0.084
	Clairton	0.011	0.059

* The Clairton Station was established in April 1990.

** The 1994 values are 12-month rolling averages from July 1993 to July 1994.

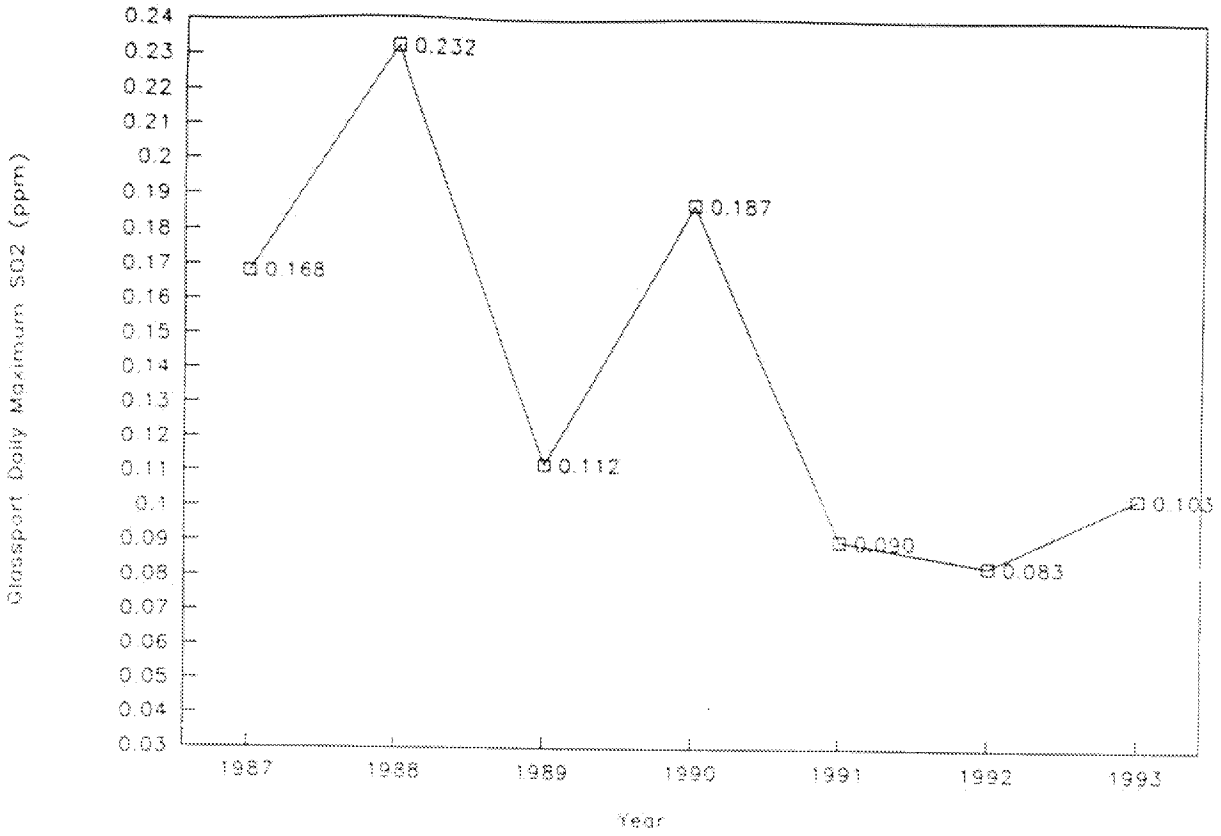

Figure 2.2.1. Daily Maximum SO_2 Per Year at Glassport

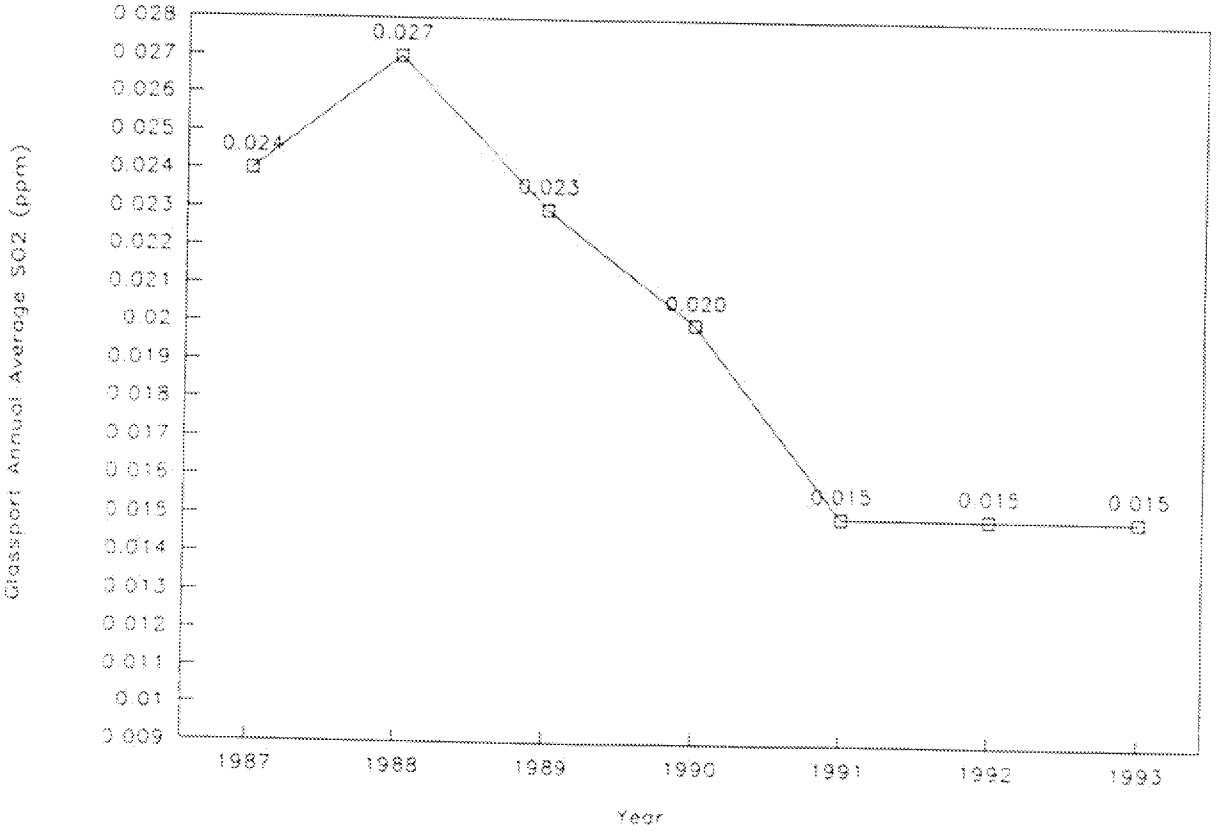

Figure 2.2.2. Annual Average SO_2 Monitored at Glassport

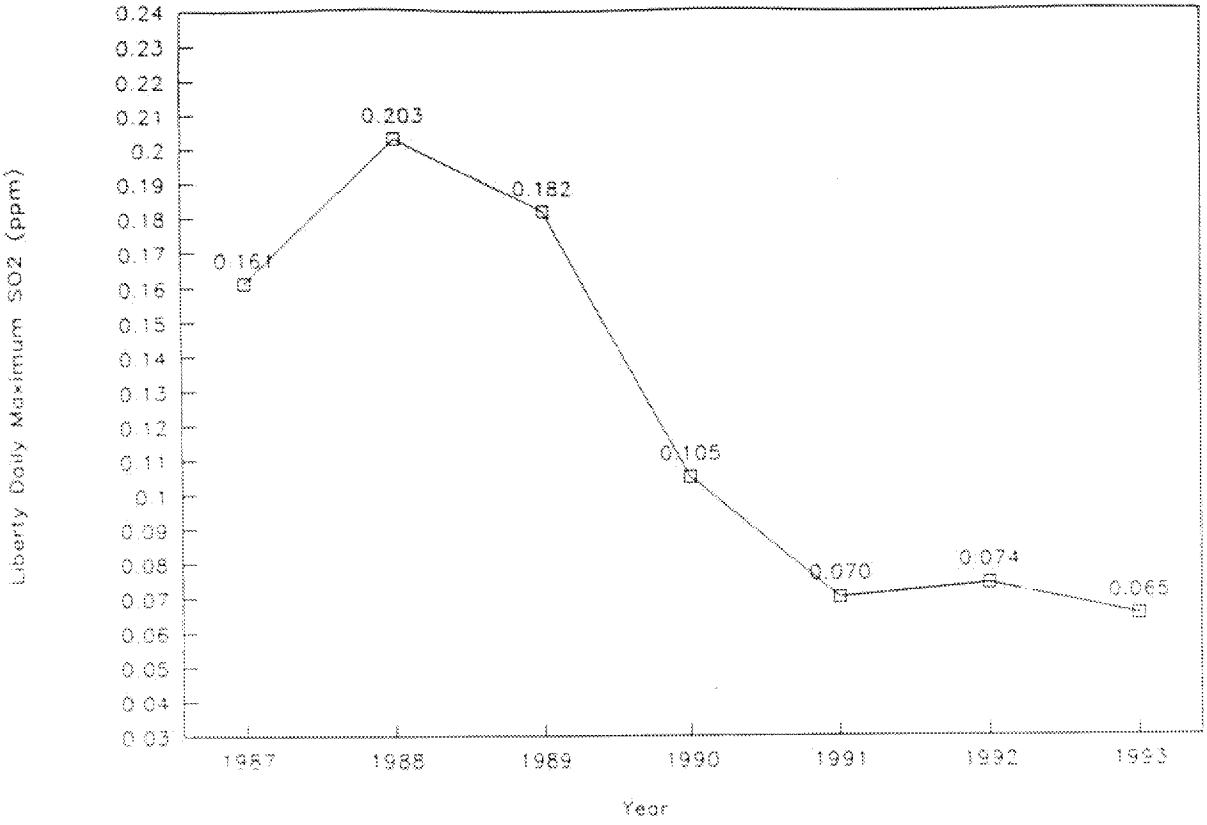

Figure 2.2.3. Daily Maximum SO_2 Per Year at Liberty

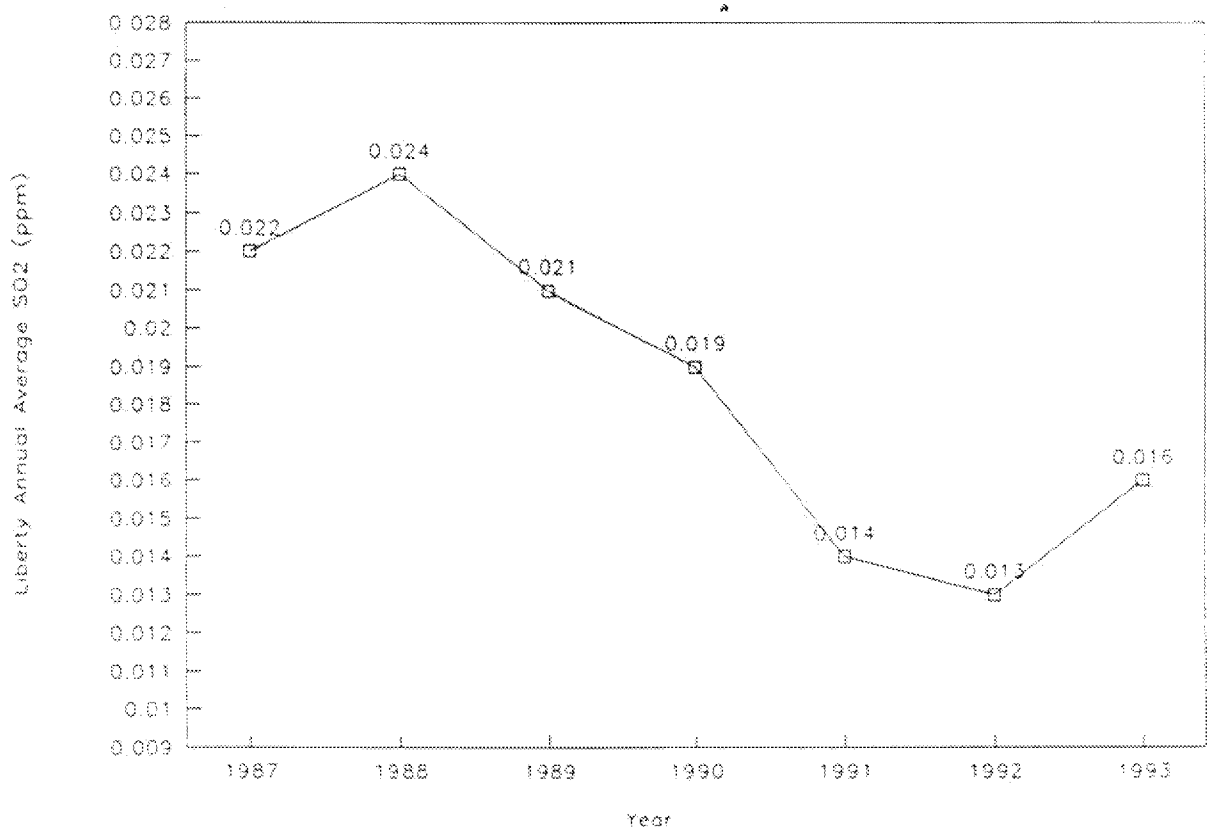

Figure 2.2.4. Annual Average SO_2 Monitored at Liberty

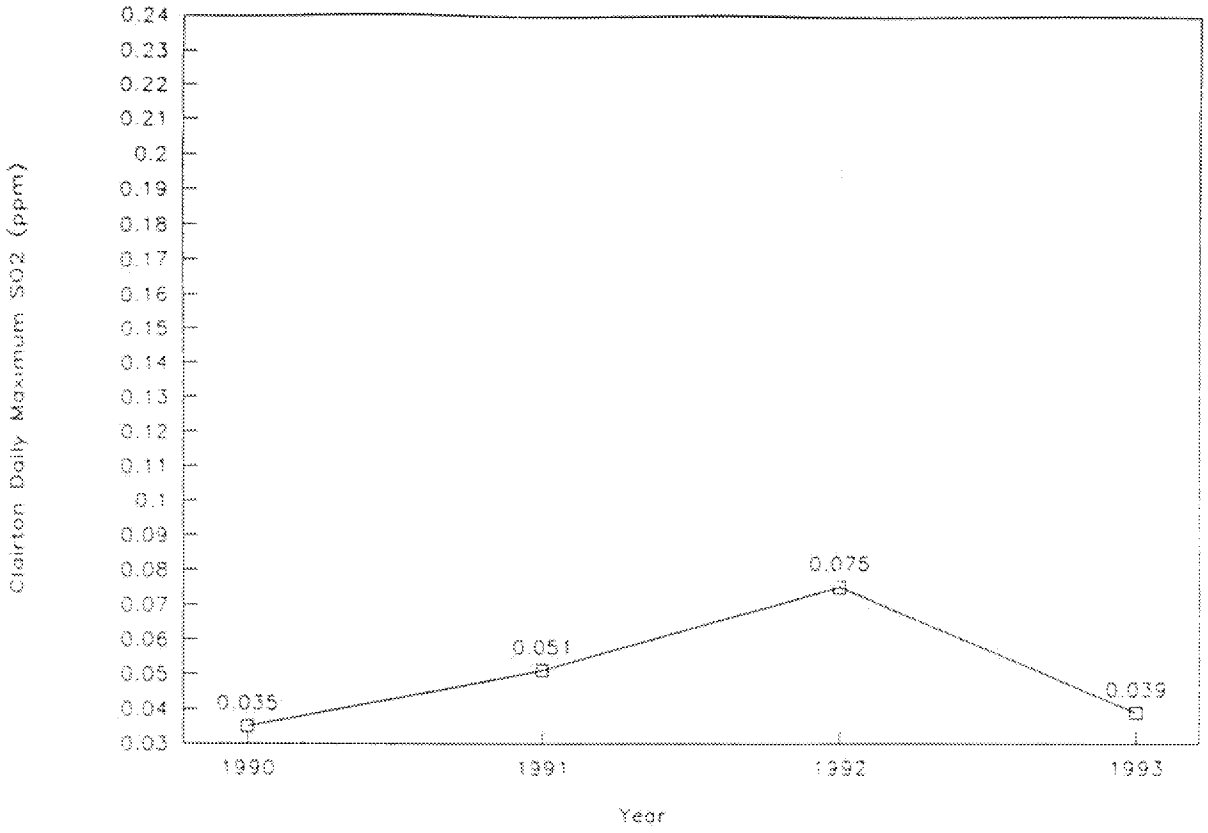

Figure 2.2.5. Daily Maximum SO_2 Per Year at Clairton

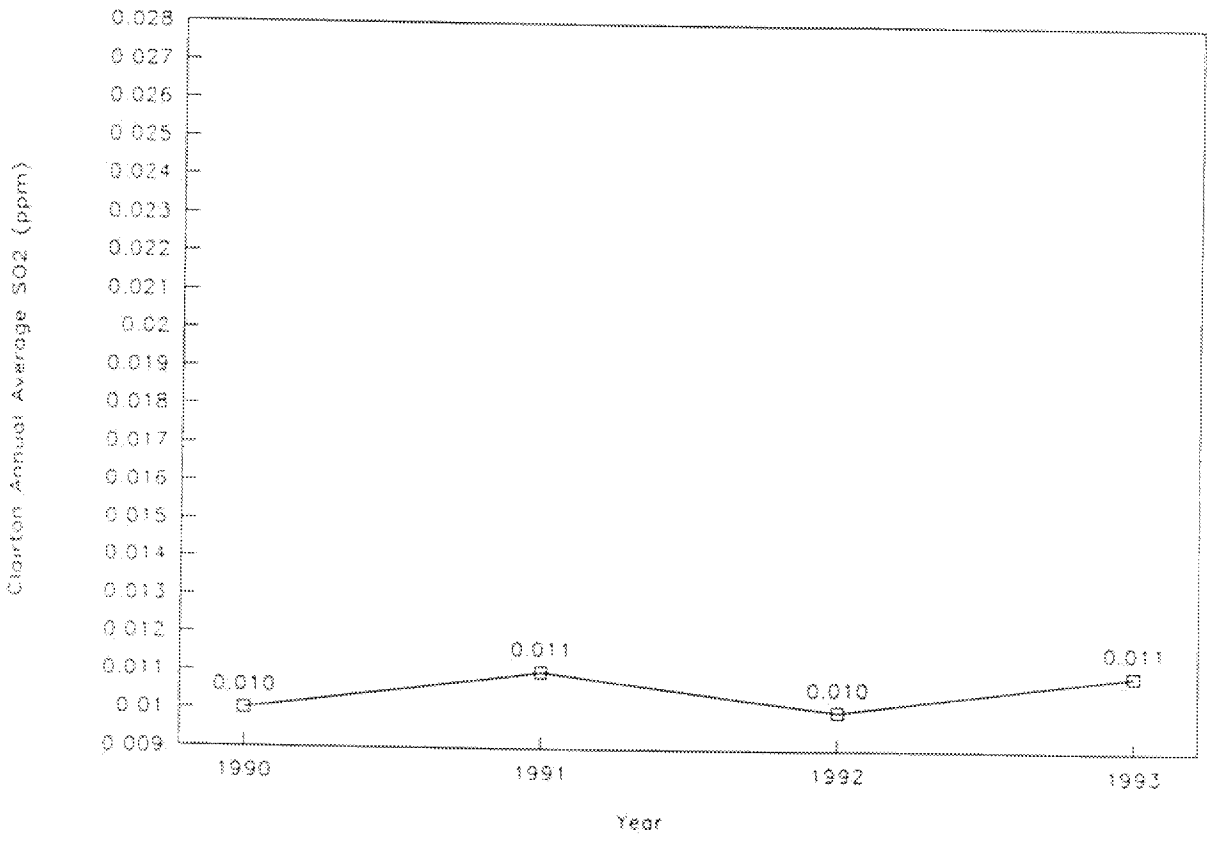

Figure 2.2.6. Annual Average SO_2 Monitored at Clairton

3.0. Correlation of Monitored Exceedances and USX Breakdowns

The three exceedances of the 24-hour standard were the result of breakdowns that occurred at the USX Clairton Works desulfurization facility. Each exceedance and correlated equipment failure is discussed in this section.

3.1. Liberty Exceedance on March 17, 1989

#1 - A faulty gasket on the Amine Absorber System Solution Exchanger resulted in a shutdown of the SCOT plant, causing elevated SO_2 emissions in the incinerator stack. Repairs were initiated (gasket replaced), and unit came back on line on March 22, 1989. Duration: Five days.

#2 - Failure of the Automated Electrical System associated with R-586 Light Oil Regenerator resulted in increased system pressure, causing a #2 control room failure. Elevated H_2S occurred in downriver gas line, causing excess SO_2 at point of combustion. Defective electrical system on R-586 Light Oil Regenerator was replaced. System came back on line March 17, 1989. Duration: One day.

3.2. Glassport Exceedance on January 31, 1990

Corrosion failure of the sulfur rundown line at the #3 Condenser of the Claus Unit resulted in shutdown of the Sulfur Plant Facility Carbonate Unit. This caused elevated H_2S levels in downriver and underfiring gas line systems, and therefore SO_2 levels at the point of combustion were elevated. Claus Unit came back on line on February 3, 1990. SCOT came back on line on February 4, 1990. Duration: 11 days.

3.3. Glassport Exceedance on April 26, 1990

#1 - An electrical power loss to the PHOSAM Absorber Top Recirculating Pumps at #1 Control Room resulted in the bypassing of coke oven gas around the Main Regenerators at the #2 Control Room. The P362 Recirculating Pump motor leads faulted causing the 4160V feed to trip which resulted in coke oven gas bypassing around the Main Regenerators (approx. 26MMSCF) for a 70 minute period. Elevated H_2S levels in the downriver gas line system occurred, causing excess levels of SO_2 at the combustion point. Repairs were initiated immediately. The cables to the feeder bus were replaced and two recirculating pumps placed into service. The bypass valve around the Main Regenerators was closed at 1400 hours, April 25, 1990. Facility back on line at same time. Duration: One day.

#2 - A light oil regenerator sequencing valve failed in the open position (due to a faulty solenoid) resulting in pressure overloading and shutdown of the C-545 and C-548 Sub-Sub Axi Compressors. As a result, the Light Oil Regenerators were taken out of service and the Sulfur Plant was bypassed. The Claus and SCOT Units remained out of service after the Light Oil Regenerators were back on line because of a partially plugged line from the coalescer to the incinerator. Elevated H_2S levels in underfiring and downriver gas line systems caused excess SO_2 levels at the point of combustion. Repairs were initiated immediately. The solenoid was changed and the stem cleaned on the North Auspuff Switching Valve. Work progressed to clear the plugged coalescer line. At 1030 hours, April 26, 1990, all coke oven batteries were reduced to 50 percent schedule as a result of the above incident and general ambient air conditions. System came back on line April 27, 1990. Duration: Three days.

4.0. Corrective Action

This Plan requires the USX Clairton Works to maintain redundancy in the coke oven gas desulfurization process by having spare equipment ready for operation. A spare Claus Plant and a Hydrogen Cyanide (HCN) Destruct Unit including a spare calaytic reactor are required along with the following spare equipment for the Vacuum Carbonate Unit: absorber column, axi compressor, stripper, seven critical heat exchangers, and pumps for nine critical locations.

In total, the spares minimize the potential for air quality violations by greatly enhancing the continued operation and availability of the desulfurization process. Having a second Claus Plant ready for operation significantly reduces the chance of pluggage causing a total desulfurization plant outage. Both the spares at the Vacuum Carbonate Unit, in which sulfides are absorbed by the carbonate solution, and the HCN Destruct Unit, which helps prevent corrosion in the Claus Plant, together reduce the likelihood of equipment failures such as those responsible for the air quality violation.

As previously explained, the air quality violation was associated with breakdowns of the sulfur-removal equipment of the USX Clairton Works and is not a fault of the current emission limits. This Plan minimizes the potential of future air quality violations associated with equipment failure by requiring that USX maintain spare equipment ready for operation.

5.0. Predicted Air Quality

As previously demonstrated in Section 2.0., the SO_2 air quality in the proposed nonattainment area has met the 24-hour standard during the past four years. The air quality over the past decade has never exceeded the annual standard. Additionally, the annual average at both Glassport and Liberty has declined since 1988. With the exception of the 1990 violation that was due to equipment breakdowns in the desulfurization facility, the daily maximum has steadily decreased within normal variations at Liberty and Glassport.

Section 3.0. clearly correlates the exceedances with breakdowns in the sulfur-removal equipment at the USX Clairton Works. Furthermore, Section 4.0. Corrective Action, explains how the spare desulfurization equipment required by this Plan reduces the chance of breakdowns causing SO_2 exceedances.

Additionally, USX has also embarked upon a program in recent years to reduce the amount of sulfur in the coke oven gas processed by the desulfurization facility. The current Allegheny County SIP standard for the Clairton Works is 50 grains of $H_2S/100\ ft^3$ of gas. USX has agreed in a federal court decree (United States, et al. v. USX Corporation, C.A. 79-709 and C.A. 91-329, W.D. Pa.) to comply with a standard of 40 grains of $H_2S/100\ ft^3$ of gas.

The air quality shows that there has not been an exceedance of the 24-hour standard during the last four years and the only violation that has occurred over this period was caused by a breakdown. The overall pollution prevention efforts of USX and the equipment redundancy required by this Plan are adequate to protect the NAAQS for SO_2 in the Liberty Borough/Clairton Area.